GIFFORD, KRASS, GROH, SPRINKLE, ANDERSON & CITKOWSKI, P.C. 280 N. OLD WOODWARD AVENUE, STE. 400, BIRMINGHAM, MICHIGAN 48009-5394 (248) 647-6000

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of fabricating a component having improved properties, comprising the steps of:

a) providing a substrate having a surface; ~~and~~

b) ~~depositing a layer of a material onto at least a portion of the surface of the substrate using a laser-assisted direct metal deposition process,~~ providing a description of the component to be fabricated,

c) heating a region of the component with a laser sufficient to form a localized meltpool;

d) feeding material into the meltpool to deposit a layer having a physical dimension;

e) optically monitoring the physical dimension;

f) automatically controlling the physical dimension in accordance with the description of the article to be fabricated based upon feedback derived through the optical monitoring; and

wherein, compared to the substrate, the layer of material exhibits:

improved resistance to wear, corrosion, or oxidation,

improved thermal conduction,

greater density, or

a different phase.

2. (Original) The method of claim 1, wherein the material of the layer is specifically chosen to promote a phase which is different from that of the substrate.

3. (Original) The method of claim 1, further including the step of using non-equilibrium synthesis to dissolve a low-solubility material into the layer of material to increase its hardness.

4. (Original) The method of claim 1, wherein the step of providing a substrate having a surface includes the step of using direct metal deposition to build the substrate on an incremental basis.

5. (Original) The method of claim 1, wherein the substrate and layer comprise a die, mold or other tool.

6. (Currently Amended) The method of claim 1, further including the step of applying the layer of material using a robotic, closed-loop ~~DMD arrangement~~ process involving steps c) through f).

7. (Currently Amended) A method of fabricating a component having improved properties, comprising the steps of:

a) providing a computer-aided design (CAD) description of ~~the~~ a component having an outer surface to be fabricated;

b) feeding material into a laser-heated meltpool to deposit material increments with physical dimensions until the component is fabricated according to the description; ~~using a laser-assisted, direct metal deposition (DMD) process in accordance with the CAD description to substantially fabricate the component having an outer surface; and~~

c) optically monitoring the physical dimensions; ~~depositing a layer of a material having a desired characteristic onto at least a portion of the surface of the component, also using a laser-assisted direct metal deposition process.~~

d) automatically controlling the physical dimensions in accordance with the optical monitoring to match the CAD description more accurately; and

e) depositing one or more additional layers of different material having a desired characteristic onto at least a portion of the outer surface of the fabricated component, using steps b) through d), above, to deposit the different material.

8. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material exhibits improved wear resistance relative to the component.

9. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material is more thermally conductive than the component itself.

10. (Canceled).

11. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material has a

GIFFORD, KRASS, GROH, SPRINKLE, ANDERSON & CITKOWSKI, P.C. 280 N. OLD WOODWARD AVENUE, STE. 400, BIRMINGHAM, MICHIGAN 48009-5394 (248) 647-6000

density greater than that of the component itself.

12. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material is more resistant to corrosion than the component itself.

13. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material is more resistant to oxidation than the component itself.

14. (Currently Amended) The method of claim 7, wherein the ~~layer of~~ different material has a phase which is different from that of the component itself.

15. (Currently Amended) The method of claim 14, further including the step of choosing the different material ~~of the layer~~ to promote a phase which is different from that of the substrate.

16. (Original) The method of claim 7, further including the step of using non-equilibrium synthesis to dissolve low a solubility material into the layer of material to increase hardness.

17. (Original) The method of claim 7, wherein the component is a die, mold or other tool.

18. (Currently Amended) The method of claim 7, further including the step of applying the layer of material using a robotic, closed-loop ~~DMD arrangement~~ process involving steps b) through e).

19. (Original) The method of claim 7, further including the step of incorporating one or more conformal cooling channels within the component during its fabrication.

20. (Currently Amended) The method of claim 7, further including the step of incorporating one or more conductive heat sinks or thermal barriers in the component during ~~its~~ the fabrication thereof.